National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the **Miamisburg Water Reclamation Facility**

Public Notice No.: 09-05-025
Public Notice Date: May 12, 2009
Comment Period Ends: June 12, 2009

OEPA Permit No.: **1PD00017*KD**
Application No.: **OH0026492**

Name and Address of Applicant:

City of Miamisburg
10 North First Street
Dayton, Ohio 45342

Name and Address of Facility Where Discharge Occurs:

City of Miamisburg Water Reclamation Facility
9139 Dayton-Cincinnati Pike
Miamisburg, Ohio 45342
Montgomery County

Receiving Water: **Great Miami River**

Subsequent Stream Network: **Ohio River**

Introduction

Development of a Fact Sheet for NPDES permits is required by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines and other treatment-technology based standards, existing effluent quality, instream biological, chemical and physical conditions, and the allocations of pollutants to meet Ohio Water Quality Standards. This Fact Sheet details the discretionary decision-making process empowered to the director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality. This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

Summary of Permit Conditions

Most of the limits and monitoring requirements contained in the existing permit are proposed to continue in the draft renewal permit. Changes incorporated into the draft permit include the removal of sampling for total dissolved residue, barium, strontium, and dieldrin, and the addition of monitoring for Bis(2-ethylhexyl) phthalate, pentachlorophenol, and dioxin. Monitoring for whole effuent toxicity has been added based upon the results of testing during the last five years. The permit also requires all sanitary sewer overflows to be reported.

Several new requirements have been incorporated into Part II of the permit. Ohio EPA rule revisions require: 1) signs to be placed at all outfalls for facilities; and 2) compliance with new operator certification regulations. Parts IV, V, and VI have been added to the permit for stormwater management.

This permit renewal is proposed for a term of approximately **four and one-half years**, expiring on **January 31, 2014**. This schedule will allow the **Miamisburg Water Reclamation Facility** permit to be on a similar schedule with the other facilities within the same watershed basin.

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Procedures for Participation in the Formulation of Final Determinations

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Water Resource Management Section
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

The application, fact sheet, public notice, permit including effluent limitations, special conditions, comments received and other documents are available for inspection and may be copied at a cost of 25 cents per page at the Ohio Environmental Protection Agency at the address shown above any time between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. Copies of the Public Notice are available at no charge at the same address.

For additional information about this fact sheet or the draft permit, contact Mike McCullough by telephone at (614) 644-4824, or by email at mike.mccullough@epa.state.oh.us.

Location of Discharge/Receiving Water Use Classification

The Miamisburg Water Reclamation Facility, or wastewater treatment plant (WWTP), discharges to the Great Miami River at River Mile (RM) 65.05 in Montgomery County. (The location of the discharge is shown in Figure 1.) The following designated uses are applicable to this segment of the Great Miami River: warmwater habitat (WWH), agricultural water supply (AWS), industrial water supply (IWS), and primary contact recreation (PCR). This segment is further identified by Ohio EPA River Code 14-001, and U.S. EPA River Reach #05080002-009. The Great Miami River in the vicinity of the Miamisburg WWTP is in the Eastern Corn Belt Plains ecoregion.

Figure 1. Location of Miamisburg WWTP

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric water quality standards are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which can not meet the Clean Water Act goals because of human-caused conditions that

can not be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural and industrial water supply.

Facility Description

The Miamisburg WWTP is designed to treat an average daily flow of 4.0 million gallons per day (MGD). The treatment plant was originally constructed in 1967, with the most recent major upgrade occurring in 2004. Treatment plant processes and/or equipment include:

- screening;
- scum removal;
- primary clarification;
- activated sludge - conventional;
- secondary clarification;
- chlorination;
- dechlorination; and
- post-aeration.

Table 1. Sludge Removed: 2004 – 2008

Year	Dry Tons Land Applied
2004	281
2005	203
2006	271
2007	252
2008	236

The treatment plant also includes a bypass after primary clarification, directly to a chlorine contact tank in the event that influent flows become too large. According to the renewal application, the bypass was not used used during 2007.

Sludge is processed by anaerobic digestion, gravity thickening, a filter press, and drying beds, and is ultimately disposed by land application. During the past five years, the quantity of sludge removed from the WWTP has remained relatively constant. (See Table 1.)

Collection System

The collection system, which serves only the City of Miamisburg, consists of 100 percent separate sanitary sewers. There are no engineered or constructed bypasses or overflows in the collection system. The estimated inflow and infiltration rate is 0.4 MGD.

Three industrial users discharge into the collection system, with all of these entities classified as categorical industrial users. The City does not operate an Ohio EPA-approved pretreatment program.

The water supply source for the service area is wells.

Description of Existing Discharge

Table 2 shows the annual effluent flow rates for the Miamisburg WWTP from 2004 through 2008 based upon Discharge Monitoring Report (DMR) data. The 50th percentile flow rates have generally remained constant during this time period while the 95th percentile and maximum flow rates have increased slightly.

Table 2. Effluent Flow Rates for Miamisburg WWTP: 2004-2008

Year	Annual Flow in MGD		
	50th Percentile	95th Percentile	Maximum
2004	2.45	4.52	9.98
2005	2.75	6.69	11.7
2006	3.23	5.91	9.93
2007	2.59	7.89	11.19
2008	2.97	7.92	10.99

From 2004 through 2008, Miamisburg reported only two sample results for mercury which resulted in four permit limit violations. These violations occurred in January and March 2006.

Table 3. Permit Violations: 2004 – 2008

Parameter	Number of Violations for:	
	Concentration	Loading
Mercury	2	2

In Table 4, effluent monitoring results are shown based upon two Ohio EPA bioassays conducted in 2007. Table 5 presents a summary of unaltered monthly operation report data for the period January 2004 through December 2008 for the Miamisburg WWTP as well as current permit limits, and monthly average PEQ_{avg} and daily maximum PEQ_{max} values.

Receiving Water Quality / Environmental Hazard Assessment

The most recent biological data is contained in the Technical Support Document (TSD) "Biological and Water Quality Study of the Middle and Lower Great Miami River and Selected Tributaries, 1995". This document can be obtained through the OEPA, Division of Surface Water website @ www.epa.state.oh.us/dsw/index . The sampling for this study was conducted in 1994 and showed that the stream was in partial attainment immediately upstream of the Miamisburg discharge at RM 65.9, and downstream at RM 64.8. Full attainment was determined for RM 64.3. A description of this section of the river is excerpted from the above referenced study and is shown below:

> "The 1995 fish sampling in the Great Miami River downstream from the Miamisburg WWTP (RM 64.8) was indicative of marginally good to fair quality. Sampling showed elevated percentages of fish with DELT anomalies which are indicative of sublethal chemical stresses. Biological scores markedly declined in this section of the Great Miami River mainstem due to an impoundment caused by the DP & L Hutchings Power Plant dam." [page 26]

Biological and chemical data collection for the lower Great Miami River TMDL (Total Maximum Daily Load) project is scheduled to begin in 2010. This sampling will provide updated use-attainment status for the lower Great Miami River (GMR) study area.

Development of Water Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are

identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

The assimilative capacity was divided among several facilities in order to account for possible interactivity of the discharges. The CONSWLA model was used to distribute the loads of those conservative parameters requiring allocation. The study area, showing relative positions of significant dischargers and tributaries, is depicted in Figure 2 on the following page.

Parameter Selection

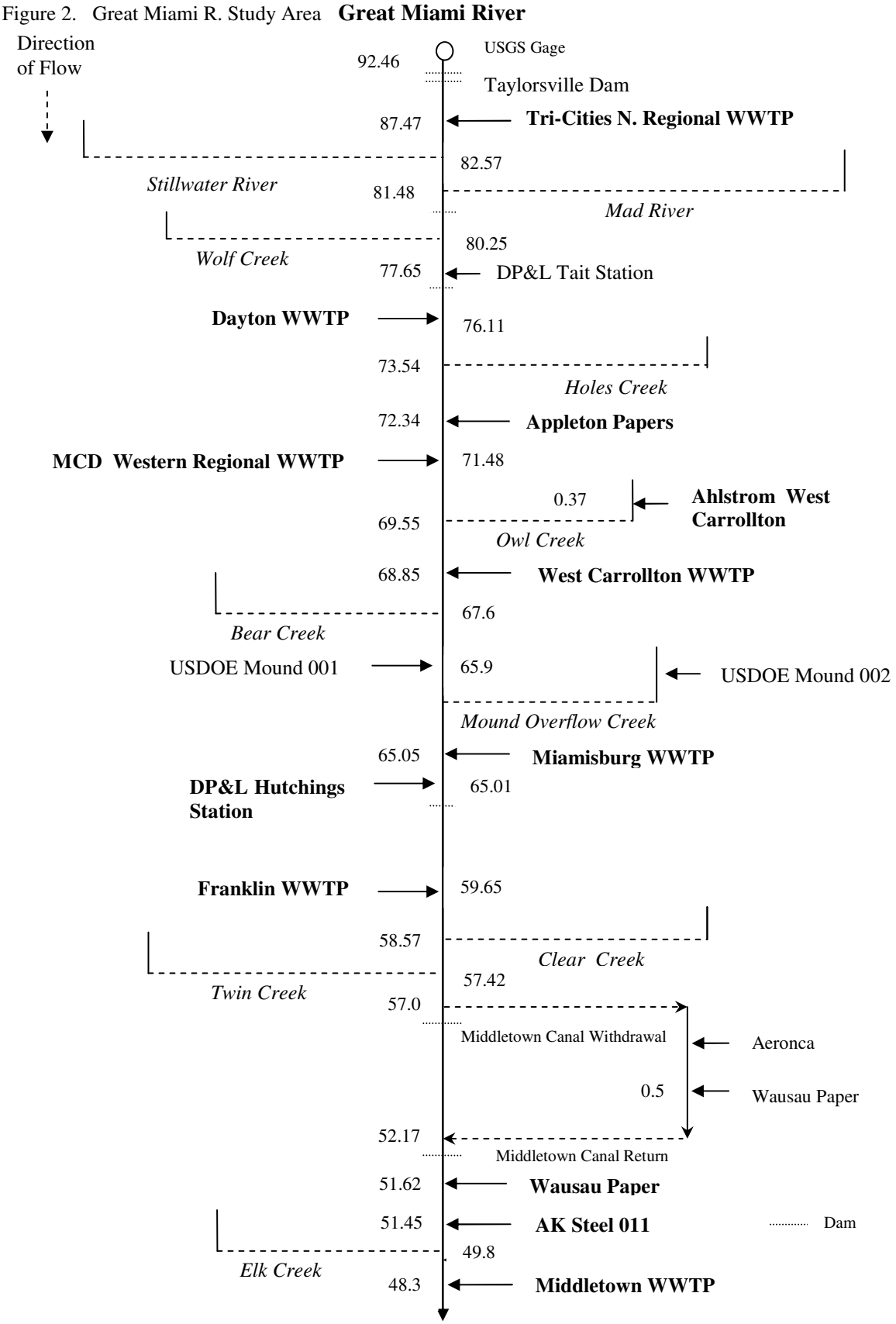
Effluent data for the Miamisburg WWTP were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to Ohio EPA – Discharge Monitoring Report (DMR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMRs)	January 2003 through December 2008
Ohio EPA bioassay data	May and June 2007

The effluent data were checked for outliers and the following values were removed: barium (788. μg/l); strontium (69.3 μg/l); copper (257. μg/l); and mercury (0.044 and 0.041 μg/l). The remaining data was evaluated statistically, and Projected Effluent Quality (PEQ) values were calculated for each pollutant. PEQ_{avg} values represent the 95th percentile of monthly average data, and PEQ_{max} values represent the 95th percentile of all data points. The average and maximum projected effluent quality (PEQ) values are presented in Table 6. For a summary of the screening results, refer to the parameter groupings in Table 10.

PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25% of the applicable WQS, the parameter does not have the reasonable potential to cause or contribute to exceedances of WQS, and no wasteload allocation is done for that parameter. If either PEQavg or PEQmax is greater than 25% of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable potential (and needs to be limited) or if monitoring is required.

Figure 2. Great Miami R. Study Area



Wasteload Allocation

For those parameters that require a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (WQS - OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. Wasteload allocations using this method are done using the following general equation: Discharger WLA = [(downstream flow x WQS) - (upstream flow x background concentration)] / (effluent flow). Discharger WLAs are divided by the discharge flow so that the WLAs are expressed as concentrations.

The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer and Winter 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow (as specified in Table 8), and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Tables 7 and 8. The wasteload allocation results to maintain all applicable criteria are presented in Table 9. The current permit limits for ammonia were evaluated and are adequate to maintain the water quality standards for this parameter. Therefore, ammonia will not be addressed further in this document.

Reasonable Potential

The preliminary effluent limits are the lowest average WLA (average PEL) and the maximum WLA (maximum PEL). To determine the reasonable potential of the discharger to exceed the WLA for each parameter, the facility's effluent quality is compared to the preliminary effluent limits. The average PEQ value (Table 6) is compared to the average PEL, and the maximum PEQ value is compared to the maximum PEL. Based on the calculated percentage of the respective average and maximum comparisons, the parameters are assigned to "groups", as listed in Table 10.

Whole Effluent Toxicity WLA

Whole effluent toxicity or "WET" is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

Water Quality Standards for WET are expressed in Ohio's narrative "free from" WQS rule (OAC 3745-1-04(D)). These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for chronic toxicity are similar to those for determining average aquatic life waste load allocations. In accordance with the Rule 3745-2-09 of the OAC, the WLA for acute toxicity is set equal to 1.0 TU_a. For the Miamisburg WWTP, the WLA values are 1.0 TU_a and 63.9 TU_c.

Effluent Limits/Hazard Management Decisions

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Federal and State laws/regulation require that dischargers meet both treatment-technology-based limits and any more stringent standards needed to comply with state WQS. Permit limits are based on the more restrictive of the two. Table 11 shows the draft NPDES permit limits for the Miamisburg WWTP, and the limits and monitoring requirements for outfall 001 are discussed in detail below.

Loading limits are based upon an average design flow rate of 4.0 MGD.

Oil and Grease, pH, Fecal Coliform, and Total Residual Chlorine

Limits proposed for oil and grease, pH, and fecal coliform are based on water quality standards (OAC 3745-1), and are a continuation of existing permit limits. Monitoring for these parameters is proposed to continue, also. The proposed limit for chlorine is a continuation of the existing permit limit and is based upon the design criteria for the treatment plant.

Total Suspended Solids, Ammonia, $CBOD_5$, and Dissolved Oxygen

Proposed limits for total suspended solids (TSS), ammonia, carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (D.O.) are based upon treatment plant design, and are a continuation of existing permit limits.

Bis(2-ethylhexyl) phthalate, Dieldrin, and Gamma-BHC

The Ohio EPA risk assessment (Table 10) places Bis(2-ethylhexyl) phthalate, dieldrin, and gamma-BHC in Group 5. For Bis(2-ethylhexyl) phthalate and gamma-BHC, this placement as well as the data in Tables 5 and 6 indicate that an environmental hazard exists and limits are necessary to protect water quality. However, the placement into Group 5 is based upon only one and two detections for Bis(2-ethylhexyl) phthalate and gamma-BHC, respectively, which may not be representative of effluent quality. Using best engineering judgement, monitoring only is proposed for these parameters in order to compile a more extensive datasets with which to assess reasonable potential for the subsequent permit renewal. The permit also includes a condition in Part II requiring the permittee to use the most sensitive analytical method approved by U.S. EPA

in order to obtain data which can be used to properly compare effluent quality with wasteload allocations for gamma-BHC.

Dieldrin has also been placed into Group 5 based upon only one detection. However, using best engineering judgment, limits or monitoring requirements are not proposed for this pollutant. The preliminary effluent limit for dieldrin (0.0014 ug/l) after the mixing zone phaseout is less than the method detection limits reported by labs that perform analytical work for Ohio wastewater plants. Monitoring for this pollutant would not yield data that is useable for making water quality-related decisions on dieldrin in the Miamisburg effluent.

Mercury and Pentachlorophenol

Ohio EPA risk assessment (Table 10) places mercury and pentachlorophenol in Group 4. This placement as well as the data in Tables 5 and 6 support that these parameters should not pose environmental hazards and limits are not necessary to protect water quality. Monitoring is proposed to continue in order to ensure that concentrations remain at low levels. Because the use of mixing zones for development of wasteload allocations for pollutants such as mercury will be be disallowed after November 2010, mercury monitoring must be conducted using a low level analytical method.[1] A tracking requirement has also been included in Part II of the permit for this parameter in accordance with Ohio Administrative Code 3745-33-07(A)(2) since the PEQs are greater than 75 percent of the most stringent waste load allocation.

In conjunction with monitoring for pentachlorophenol, quarterly monitoring for dioxin for the first 12 months of the permit has been included in accordance with rule 3745-33-07(A)(4), which states that monitoring for this parameter is required when pentachlorophenol is detected in the effluent. The dioxin monitoring must be reported under the "Toxicity Equivalent" parameter name.

Copper, Free Cyanide, Nickel, and Zinc

Ohio EPA risk assessment (Table 10) places copper, free cyanide, nickel, and zinc in Group 3. This placement as well as the data in Tables 5 and 6 support that these parameters should not pose environmental hazards and limits are not necessary to protect water quality. Monitoring is proposed to continue in order to ensure that concentrations remain at low levels.

Cadmium, Total Recoverable Chromium, Dissolved Hexavalent Chromium, Lead, and Nitrate+Nitrite

Ohio EPA risk assessment (Table 10) places cadmium, total recoverable chromium, dissolved hexavalent chromium (hexchrome), lead, and nitrate+nitrite in Group 2. This placement as well as the data in Tables 5 and 6 support that these parameters should not pose an environmental hazard and limits are not necessary to protect water quality. Even though the reported data shows that some of these pollutants have had no detections over the past five years, it is not uncommon to find all of these pollutants in the effluent from municipal wastewater treatment facilities. Also, Ohio EPA guidance recommends monitoring for these parameters at municipal wastewater

[1] In November 2010, the use of mixing zones to determine the waste load allocation for bioaccumulative chemicals of concern (BCCs) will no longer be allowed. This means that limits for BCCs after November 2010 must meet water quality standards with no allowances for dilution. Since mercury is considered a BCC, discharges must comply with water quality standards at that time. In order to obtain mercury effluent data which can be compared to the water quality standards, the permittee must use a low level method for mercury sampling and analysis.

treatment facilities. As a result, monitoring for these parameters is proposed to document that concentrations remain at low levels.

Water Temperature, Phosphorus, TKN, and Flow Rate

Monitoring is proposed to continue for temperature and flow rate in order to assist in the evaluation of effluent quality and treatment plant performance, and in accordance with Ohio EPA guidance. Monitoring for phosphorus and TKN (as well as nitrate+nitrite) are proposed to continue based upon the water quality impairment due to nutrients in the Great Miami River and to provide supplemental data for the upcoming biological and chemical assessment of this stream.

Additional monitoring requirements proposed at the final effluent, influent, upstream/downstream and sludge stations are included for all facilities in Ohio and vary according to the type and size of the discharge. Limits and monitoring requirements proposed for the disposal of sewage sludge by land application are based on OAC 3745-40. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

Other Requirements

Provisions for reporting sanitary sewer overflows (SSOs) are proposed to be included in this permit renewal. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public.

Part II of the permit also includes requirements for signs to be placed at each outfall to the Great Miami River, providing information about the discharge. Signage at outfalls is required pursuant to Ohio Administrative Code 3745-33-08(A).

Parts IV, V, and VI have been included with the draft permit in order to ensure that any storm water flows from the facility site are properly regulated and managed. (The City submitted a "No Exposure Certification" [NOE] on October 28, 2003, however, the coverage provided under the NOE expires after five years unless it is renewed.) As an alternative to complying with Parts IV, V, and VI, the City may seek permit coverage for the Miamisburg WWTP under the general permit for industrial stormwater (permit # OHR000004) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the City submits a Notice of Intent (NOI) for coverage under the general permit for industrial stormwater or submits a No Exposure Certification for the WWTP, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

An internal monitoring station (602) has been added to the permit for the treatment plant bypass. The City must report data for any bypasses which occur, in accordance with the requirements for this monitoring station.

Additivity of Carcinogenic Pollutants

Bis(2-ethylhexyl) phthalate, dieldrin, gamma-BHC (gamma-Hexachlorocyclohexane), and pentachlorophenol are carcinogens, which requires the evaluation of the additive effect of these

pollutants. Ohio Administrative Code 3745-33-07(A)(8) states that the additivity equation shown below must be included in the permit and used to determine compliance unless certain conditions are met.

Additivity equation: $MAC_1/284 + MAC_2/0.0014 + MAC_1/0.63 + MAC_2/6749 <= 1.0$

where MAC_1, MAC_2, MAC_3, and MAC_4 represent the monthly average concentration for Bis(2-ethylhexyl) phthalate, dieldrin, gamma-BHC, and pentachlorophenol, respectively.

Additivity is combined toxic effect of carcinogenic pollutants. Carcinogens are evaluated to determine if: 1) the inclusion of the additivity equation to limit the total carcinogen risk to less than 1×10^{-5} (one in 100,000) is necessary, 2) other permit limits are protective of carcinogen additivity, or 3) there is no reasonable potential for total carcinogen risk to be exceeded. If a preliminary effluent limit (or PEL) for an additive pollutant is less than the quantification level for that pollutant, the Director may remove that pollutant from the consideration of additivity. For dieldrin, the PEL which is applicable after the phaseout of mixing zones for BCCs is less than the quantification level for the approved EPA analytical method. Therefore, this pollutant can be removed from the above equation.

Ohio Administrative Code 3745-33-07(A)(8)(ii) specifies that reasonable potential for additive effects is determined by dividing the $PEQ_{average}$ by the human health wasteload allocation for each pollutant and then adding the results. If the sum of these quotients is less than 1.0, there is no reasonable potential and the additivity equation is not needed. As shown below, the evaluation of reasonable potential for Bis(2-ethylhexyl) phthalate, gamma-BHC, and pentachlorophenol shows that the sum of the quotients is less than 1.0, so the additivity equation has not been included in the permit.

$(212.2 / 284) + (0.062 / 0.63) + (31.62 / 6749) =$
$0.75 + 0.0984 + 0.0047 = 0.85$, which is less than 1.0

Operator Certification

In December 2006, rule revisions became effective which affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item B of this NPDES permit represents language necessary to implement rules 3745-7-02, 3745-7-04, and 3745-7-08 of the Ohio Administrative Code (OAC).

Based permit requirements, the permittee must submit a list of the "operators of record" within 60 days after the effective date of the permit. An operator of record is responsible for the overall technical operation of the facilities, and with the exception as defined in OAC 3745-7-02(E), must have a valid Class III certification for the Miamisburg WWTP. The permittee must also notify Ohio EPA within three days of any changes in the operator of record.

The Miamisburg WWTP is currently a Class III facility. The permittee may request a reclassification of the treatment works at any time by submitting a request for a permit modification.

Whole Effluent Toxicity Reasonable Potential

Ohio EPA conducted two bioassays using the effluent from outfall 001 in 2007. While the June 2007 test showed no evidence of toxicity, the May 2007 composite test was acutely toxic for *Ceriodaphnia dubia*, with 90 percent mortality. Based upon these results, the Miamisburg WWTP has been placed in

biomonitoring category 3[2], and quarterly monitoring for the duration of the permit is required for *Ceriodaphnia dubia* and fathead minnows.

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[2] Biomonitoring category 3 indicates that toxicity caused by the effluent is possible and increased monitoring frequency is appropriate. See Table 1 in Ohio Administrative Code 3745-33-07.

Table 4. Effluent Characterization Based Upon Ohio EPA Bioassays

Summary of analytical results for Miamisburg WWTP outfall 1PD00017001. Blank cells mean the parameter was not analyzed.

Parameter	Ohio EPA Bioassays	
	April 30, 2007	June 25, 2007
Ammonia (mg/l)	0.627	0.07
Arsenic (ug/l)	2.2	3.7
Barium (ug/l)	98.	94.
Bis(2-ethylhexyl) phthalate (ug/l)	76.5	< 10.2
Bromodichloromethane (ug/l)	1.51	< 0.5
Calcium (mg/l)	106.	105.
Chloride (mg/l)	300.	429.
Chloroform (ug/l)	2.52	0.99
Chromium (ug/l)	67.	< 30.
Copper (ug/l)	10.	22.
Dieldrin (ug/l)	0.0076	< 0.002
Cyanide, Free (mg/l)	0.007	< 0.005
Dissolved solids, total (mg/l)	940.	1180.
Iron (ug/l)	529.	127.
Magnesium (mg/l)	35.	35.
Manganese (ug/l)	45.	39.
Nickel (ug/l)	109.	< 40.
Nitrate+Nitrite (mg/l)	14.1	27.2
Pentachlorophenol (ug/l)	11.4	< 10.2
Phenol (ug/l)	2.4	< 2.
Phosphorus (mg/l)	2.03	4.26
Strontium (ug/l)	646.	849.
TKN (mg/l)	1.77	1.46
Toluene (ug/l)	0.65	< 0.5
Zinc (ug/l)	31.	81.

Table 5. Effluent Characterization and Decision Criteria: 2004 – 2008

Summary of current permit limits and unaltered discharge monitoring report (DMR) data for Miamisburg WWTP outfall 001, and station 601. Decision Criteria: PEQ_{avg} = monthly average; PEQ_{max} = daily maximum analytical results. * Means "summer limits."

			Current Permit Limits			Percentiles			Decision Criteria		
Parameter	Season	Units	30 day	Daily	# Obs.	50th	95th	Data Range	# Obs.	PEQ_{ave}	PEQ_{max}
Outfall 001											
Water Temperature	Annual	C	Monitor only		1827	17.8	23.4	9.1-24.6			
Dissolved Oxygen	Summer	mg/l	Not less than 5.0		920	8.1	9.1	5.6-9.7			
Dissolved Oxygen	Winter	mg/l	Not less than 5.0		907	9	9.9	5.7-11.1			
Dissolved Oxygen	Summer	kg/day			920	69.8	141	37.4-241			
Dissolved Oxygen	Winter	kg/day			907	120	277	44-418			
Residue, Total Dissolved	Annual	mg/l	Monitor only		60	1070	1300	801-1500			
Residue, Total Dissolved	Annual	kg/day			60	11200	19400	5960-24500			
Total Suspended Solids	Annual	mg/l	30	45	729	5	11	1-30			
Total Suspended Solids	Annual	kg/day	341	511	729	53.9	159	6.93-1010			
Oil and Grease, Freon Extr-Grav Meth	Annual	mg/l	Not more than 10.0		60	0	0	0-0			
Oil and Grease, Freon Extr-Grav Meth	Annual	kg/day			60	0	0	0-0			
Nitrogen, Ammonia (NH3)	Summer	mg/l	9	13.5	366	0.32	2.07	0.1-6.58			
Nitrogen, Ammonia (NH3)	Winter	mg/l	15	23	363	0.2	2.43	0.05-8.15			
Nitrogen, Ammonia (NH3)	Summer	kg/day	102	153	366	2.92	21.9	1.24-61.7			
Nitrogen, Ammonia (NH3)	Winter	kg/day	170	261	363	2.59	30.9	0.804-73.2			
Nitrogen Kjeldahl, Total	Annual	mg/l	Monitor only		60	0	1.72	0-3.66			
Nitrogen Kjeldahl, Total	Annual	kg/day			60	0	20.8	0-47.1			
Nitrite Plus Nitrate, Total	Annual	mg/l	Monitor only		60	15.9	26.6	6.58-35.6			
Nitrite Plus Nitrate, Total	Annual	kg/day			60	162	265	86.5-321			
Phosphorus, Total (P)	Annual	mg/l	Monitor only		60	2.23	3.67	0.71-4.98			
Phosphorus, Total (P)	Annual	kg/day			60	21.5	32.2	11.2-36.7			
Cyanide, Free	Annual	mg/l	Monitor only		20	0	0	0-0			
Cyanide, Free	Annual	kg/day			20	0	0	0-0			

Table 5. Effluent Characterization and Decision Criteria: 2004 – 2008

Summary of current permit limits and unaltered discharge monitoring report (DMR) data for Miamisburg WWTP outfall 001, and station 601. Decision Criteria: PEQ_{avg} = monthly average; PEQ_{max} = daily maximum analytical results. * Means "summer limits."

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50th	95th		# Obs.	PEQ_{ave}	PEQ_{max}
Barium, Total Recoverable	Annual	ug/l	Monitor only		30	76.7	101	0.0708-788			
Barium, Total Recoverable	Annual	kg/day			30	0.839	2.13	0.000605-14.1			
Nickel, Total Recoverable	Annual	ug/l	Monitor only		20	0	7.4	0-148			
Nickel, Total Recoverable	Annual	kg/day			20	0	0.0384	0-0.767			
Strontium, Total Recoverable	Annual	ug/l	Monitor only		30	564	809	0.497-849			
Strontium, Total Recoverable	Annual	kg/day			30	6.53	10.9	0.00525-12.5			
Zinc, Total Recoverable	Annual	ug/l	Monitor only		20	33.6	55.3	14.9-113			
Zinc, Total Recoverable	Annual	kg/day			20	0.326	0.636	0.253-1.87			
Cadmium, Total Recoverable	Annual	ug/l	Monitor only		20	0	0.635	0-1.3			
Cadmium, Total Recoverable	Annual	kg/day			20	0	0.00464	0-0.0142			
Lead, Total Recoverable	Annual	ug/l	Monitor only		20	0	0	0-0			
Lead, Total Recoverable	Annual	kg/day			20	0	0	0-0			
Chromium, Total Recoverable	Annual	ug/l	Monitor only		20	0	0	0-0			
Chromium, Total Recoverable	Annual	kg/day			20	0	0	0-0			
Copper, Total Recoverable	Annual	ug/l	Monitor only		20	6.55	43	0-257			
Copper, Total Recoverable	Annual	kg/day			20	0.0794	0.29	0-1.33			
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor only		20	0	0	0-0			
Chromium, Dissolved Hexavalent	Annual	kg/day			20	0	0	0-0			
Fecal Coliform	Annual	#/100 ml	1000	2000	366	47.5	493	0-5100			
Gamma-BHC, Total	Annual	ug/l	Monitor only		20	0	0.0015	0-0.03			
Gamma-BHC, Total	Annual	kg/day			20	0	1.64E-05	0-0.000327			
Dieldrin, Whole Sample	Annual	ug/l	Monitor only		20	0	0.00015	0-0.003			
Dieldrin, Whole Sample	Annual	kg/day			20	0	1.64E-06	0-0.0000327			
Flow Rate	Summer	MGD			920	2.32	4.32	1.19-9.83			

Table 5. Effluent Characterization and Decision Criteria: 2004 – 2008

Summary of current permit limits and unaltered discharge monitoring report (DMR) data for Miamisburg WWTP outfall 001, and station 601. Decision Criteria: PEQ_{avg} = monthly average; PEQ_{max} = daily maximum analytical results. * Means "summer limits."

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50th	95th		# Obs.	PEQ_{ave}	PEQ_{max}
Flow Rate	Winter	MGD			907	3.5	8.39	1.42-11.7			
Flow Rate	Annual	MGD	Monitor only		1827	2.79	6.65	1.19-11.7			
Chlorine, Total Residual	Annual	mg/l	--	0.038	920	0	0	0-0			
Chlorine, Total Residual	Annual	kg/day			920	0	0	0-0			
Mercury, Total (Low Level)	Annual	ng/l	29	2100	61	3.61	15.1	0-44.5			
Mercury, Total (Low Level)	Annual	kg/day	0.0003	0.024	61	0.000037	0.000138	0-0.00106			
pH, Maximum	Annual	S.U.	Not more than 9.0		1827	7.6	7.8	7-8.7			
pH, Minimum	Annual	S.U.	Not less than 6.5		1827	7.5	7.7	6.9-7.9			
CBOD 5 day	Summer	mg/l	25	40	365	3	6	1-8			
CBOD 5 day	Winter	mg/l	25	40	363	2	4	0-9			
CBOD 5 day	Summer	kg/day	284	454	365	25.9	55.3	7.48-171			
CBOD 5 day	Winter	kg/day	284	454	363	25.9	82.4	0-204			
Outfall 601											
Total Suspended Solids	Annual	mg/l			729	218	373	30-3120			
pH, Maximum	Annual	S.U.			1827	7.7	7.9	7.2-8.7			
pH, Minimum	Annual	S.U.			1827	7.5	7.7	6.4-8.2			
CBOD 5 day	Summer	mg/l			365	131	227	43-362			
CBOD 5 day	Winter	mg/l			363	99	198	16-518			

Table 6. Effluent Data for Miamisburg WWTP

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Self-Monitoring (MOR) Data					
Dissolved Solids, total (TDS)	mg/l	60	60	1220.	1380.
Ammonia-S	mg/l	286	286	0.70	1.34
Ammonia-W	mg/l	208	208	2.25	4.48
NO_2+NO_3	mg/l	68	68	23.03	32.13
Phosphorus	mg/l	68	68	3.086	4.258
Cyanide - free	µg/l	9	1	6.57	9.0
Barium	µg/l	29	29	92.85	106.5
Nickel - TR	µg/l	23	2	140.5	192.4
Strontium	µg/l	29	29	777.4	947.1
Zinc - TR	µg/l	28	19	53.36	84.4
Cadmium – TR	µg/l	23	2	1.234	1.69
Lead - TR	µg/l	23	0	--	--
Chromium - TR	µg/l	23	0	--	--
Copper - TR	µg/l	27	24	13.56	20.31
$Chromium^{+6}$, diss.	µg/l	23	0	--	--
Gamma-BHC	µg/l	20	2	0.062	0.085
Dieldrin	µg/l	19	1	0.003	0.004
Chlorine, tot. res.	µg/l	1043	0	--	--
Mercury	µg/l	60	59	0.0093	0.0145
Other Data [A]					
Arsenic	µg/l	2	2	10.26	14.06
Bis(2-ethylhexyl)phthalate [C]	µg/l	2	1	212.2	290.7
Bromodichloromethane [C]	µg/l	2	1	4.189	5.738
Pentachlorophenol [C]	µg/l	2	1	31.62	43.32
Chloroform [C]	µg/l	2	2	6.99	9.576
Toluene	µg/l	2	1	1.803	2.47

[A] Other data sources include Ohio EPA data.
[C] Carcinogen

Table 7. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Average: Agri-culture	Average: Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Aldrin	µg/l	0.0014 [D]	--	--	--	--
Antimony	µg/l	4300.	--	190.	900.	1800.
Arsenic	µg/l	--	100.	150.	340.	680.
Barium	µg/l	--	--	220.	2000.	4000.
Beryllium [A]	µg/l	280.	100.	67.	570.	1100.
Bis(2-ethylhexyl)phthalate	µg/l	59. [D]	--	8.4	1100.	2100.
Boron	µg/l	--	--	950.	8500.	17000.
Bromodichloromethane	µg/l	460.	--	--	--	--
Bromoform	µg/l	3600.	--	230.	1100.	2200.
Bromomethane	µg/l	4000.	--	16.	38.	75.
Cadmium [A]	µg/l	--	50.	6.0	16.	32.
Chlorine, tot. res.	µg/l	--	--	11.	19.	38.
Chloroform	µg/l	4700. [D]	--	140.	1300.	2600.
Chromium^{+6}, diss.	µg/l	--	--	11.	16.	31.
Chromium -TR [A]	µg/l	--	100.	220.	4500.	9100.
Cobalt	µg/l	--	--	24.	220.	440.
Copper [A]	µg/l	1300.	500.	24.	40.	81.
Cyanide, free	µg/l	220000.	--	12.	46.	92.
Dibromochloromethane	µg/l	340. [D]	--	--	--	--
1,4-Dichlorobenzene	µg/l	2600.	--	9.4	57.	110.
Dichlorobromomethane	µg/l	460. [D]	--	--	--	--
Dieldrin [B]	µg/l	0.0014 [D]	--	0.056	0.24	0.47
Endosulfan	µg/l	240.	--	--	--	--
Endrin Aldehyde	µg/l	0.81	--	--	--	--
Fluoride	µg/l	--	2000.	--	--	--
Heptachlor Epoxide	µg/l	0.0011 [D]	--	--	--	--
beta-BHC [B]	µg/l	0.46 [D]	--	--	--	--
gamma-BHC (Lindane) [B]	µg/l	0.63 [D]	--	0.057	0.95	1.9
Iron	µg/l	--	5000.	--	--	--
Lead [A]	µg/l	--	100.	27.	510.	1000.
Mercury [B]	µg/l	0.012	10.	0.91	1.7	3.4
Methylene Chloride	µg/l	16000.	--	1900.	11000.	22000.
Methyl Ethyl Ketone	µg/l	--	--	22000.	200000.	400000.
Molybdenum	µg/l	--	--	20000.	190000.	370000.
Nickel [A]	µg/l	4600.	200.	140.	1200.	2400.
Nitrate+Nitrite	mg/l	--	100.	--	--	--
Pentachlorophenol [C]	µg/l	82. [D]	--	25.	32.	64.

Table 7. Water Quality Criteria in the Study Area -continued.

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Average: Agri-culture	Average: Aquatic Life	Maximum Aquatic Life	Inside Mixing Zone Maximum
Phenol	µg/l	4600000.	--	400.	4700.	9400.
SAS-310	µg/l	--	--	0.61	5.0	10.
Selenium	µg/l	11000.	50.	5.0	--	--
Silver [A]	µg/l	--	--	1.3	11.	22.
Strontium	µg/l	--	--	21000.	40000.	81000.
Tetrachloroethylene [D]	µg/l	89.	--	53.	430.	850.
1,1,2,2-Tetrachloroethane	µg/l	110. [D]	--	260.	910.	1800.
Thallium	µg/l	6.3	--	17.	79.	160.
Tin	µg/l	--	--	180.	1600.	3200.
Toluene	µg/l	200000.	--	62.	560.	1100.
Total Dissolved Solids (TDS)	mg/l	--	--	1500.	--	--
1,1,1-Trichloroethane	µg/l	--	--	76.	690.	1400.
1,1,2-Trichloroethane	µg/l	420. [D]	--	740.	3300.	6600.
2,4,6-Trichlorophenol	µg/l	65. [D]	--	4.9	39.	79.
Zinc [A]	µg/l	69000.	25000.	310.	310.	620.

[A] Aquatic Life Criteria is hardness-based.
[B] Bioaccumulative Chemical of Concern (BCC)
[C] Aquatic Life Criteria is pH based.
[D] This criterion is based upon a carcinogenic endpoint.

Table 8. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
Upstream Flow				
GMR at Taylorsville				
7Q10	cfs	summer	52.	USGS gage #03263000, 1921-97 data
		winter	83.	USGS gage #03263000, 1921-97 data
		annual	50.	USGS gage #03263000, 1921-97 data
1Q10	cfs	annual	43.	USGS gage #03263000, 1921-97 data
30Q10	cfs	summer	60.	USGS gage #03263000, 1921-97 data
			winter	
			116.	USGS gage #03263000, 1921-97 data
Harmonic Mean Flow	cfs	annual	241.	USGS gage #03263000, 1921-97 data
Mixing Assumption	%	average	100	Stream-to-discharge ratio
(GMR & Tribs.)	%	maximum	100	Stream-to-discharge ratio
Stillwater River at Mouth				
7Q10	cfs	summer	16.6	USGS gage #03266000, 1925-97 data
		winter	41.6	USGS gage #03266000, 1925-97 data
			annual	
			16.6	USGS gage #03266000, 1925-97 data
1Q10	cfs	annual	11.4	USGS gage #03266000, 1925-97 data
30Q10	cfs	summer	22.9	USGS gage #03266000, 1925-97 data
			winter	
			57.2	USGS gage #03266000, 1925-97 data
Harmonic Mean Flow	cfs	annual	111.3	USGS gage #03266000, 1925-97 data
Mad River at Mouth				
7Q10	cfs	summer	143.8	USGS gage #03270000, 1914-21, 24-97
		winter	182.1	USGS gage #03270000, 1914-21, 24-97
		annual	141.8	USGS gage #03270000, 1914-21, 24-97
1Q10	cfs	annual	134.5	USGS gage #03270000, 1914-21, 24-97
30Q10	cfs	summer	158.3	USGS gage #03270000, 1914-21, 24-97
		winter	212.1	USGS gage #03270000, 1914-21, 24-97
Harmonic Mean Flow	cfs	annual	391.1	USGS gage #03270000, 1914-21, 24-97
Wolf Creek at Mouth				
7Q10	cfs	summer	1.74	USGS gage #03271000, 1938-50, 86-97
		winter	3.38	USGS gage #03271000, 1938-50, 86-97
		annual	1.64	USGS gage #03271000, 1938-50, 86-97
1Q10	cfs	annual	1.33	USGS gage #03271000, 1938-50, 86-97
30Q10	cfs	summer	2.46	USGS gage #03271000, 1938-50, 86-97
		winter	6.35	USGS gage #03271000, 1938-50, 86-97
Harmonic Mean Flow	cfs	annual	12.4	USGS gage #03271000, 1938-50, 86-97

Table 8. Instream Conditions and Discharger Flow - continued.

Parameter	Units		Value	Basis
Twin Creek at Mouth				
7Q10	cfs	summer	5.4	USGS gage #03272000, 1914-23, 27-97
		winter	16.1	USGS gage #03272000, 1914-23, 27-97
		annual	5.4	USGS gage #03272000, 1914-23, 27-97
1Q10	cfs	annual	4.71	USGS gage #03272000, 1914-23, 27-97
30Q10	cfs	summer	7.24	USGS gage #03272000, 1914-23, 27-97
		winter	24.1	USGS gage #03272000, 1914-23, 27-97
Harmonic Mean Flow	cfs	annual	40.5	USGS gage #03272000, 1914-23, 27-97
Four Mile Creek at Mouth				
7Q10	cfs	summer	6.84	USGS gage #03272700, 1970-97 data
		winter	15.5	USGS gage #03272700, 1970-97 data
		annual	6.84	USGS gage #03272700, 1970-97 data
1Q10	cfs	annual	5.92	USGS gage #03272700, 1970-97 data
30Q10	cfs	summer	9.58	USGS gage #03272700, 1970-97 data
		winter	31.9	USGS gage #03272700, 1970-97 data
Harmonic Mean Flow	cfs	annual	50.7	USGS gage #03272700, 1970-97 data
Holes Creek at Mouth				
7Q10	cfs	summer	1.11	USGS gage #03271300, 1959-72 data
		winter	2.55	USGS gage #03271300, 1959-72 data
		annual	1.11	USGS gage #03271300, 1959-72 data
1Q10	cfs	annual	1.11	USGS gage #03271300, 1959-72 data
30Q10	cfs	summer	1.43	USGS gage #03271300, 1959-72 data
		winter	3.5	USGS gage #03271300, 1959-72 data
Harmonic Mean Flow	cfs	annual	8.31	USGS gage #03272000, 1914-23, 27-97
Indian Creek at Mouth				
7Q10	cfs	summer	0.2	USGS gage #03274200, 1961-69 data
		winter	0.5	USGS gage #03274200, 1961-69 data
		annual	0.2	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.2	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.3	USGS gage #03274200, 1961-69 data
		winter	0.8	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	1.17	USGS gage #03272800, 1960-72 data
Clear Creek at Mouth				
7Q10	cfs	summer	0.4	USGS gage #03271700, 1959-69 data
		winter	1.5	USGS gage #03271700, 1959-69 data
		annual	0.4	USGS gage #03271700, 1959-69 data
1Q10	cfs	annual	0.4	USGS gage #03271700, 1959-69 data
30Q10	cfs	summer	0.6	USGS gage #03271700, 1959-69 data
		winter	2.5	USGS gage #03271700, 1959-69 data
Harmonic Mean Flow	cfs	annual	3.0	USGS gage #03272000, 1914-23, 27-97

Table 8. Instream Conditions and Discharger Flow - continued.

Parameter	Units		Value	Basis
Elk Creek at Mouth				
7Q10	cfs	summer	0.4	USGS gage #03272200, 1960-67 data
		winter	1.3	USGS gage #03272200, 1960-67 data
		annual	0.4	USGS gage #03272200, 1960-67 data
1Q10	cfs	annual	0.4	USGS gage #03272200, 1960-67 data
30Q10	cfs	summer	0.6	USGS gage #03272200, 1960-67 data
		winter	2.1	USGS gage #03272200, 1960-67 data
Harmonic Mean Flow	cfs	annual	3.0	USGS gage #03272000, 1914-23, 27-97
Bear Creek at Mouth				
7Q10	cfs	summer	2.21	USGS gage #03272000, 1914-23, 27-97
		winter	4.02	USGS gage #03272000, 1914-23, 27-97
		annual	2.21	USGS gage #03272000, 1914-23, 27-97
1Q10	cfs	annual	2.1	USGS gage #03272000, 1914-23, 27-97
30Q10	cfs	summer	2.52	USGS gage #03272000, 1914-23, 27-97
		winter	5.38	USGS gage #03272000, 1914-23, 27-97
Harmonic Mean Flow	cfs	annual	8.14	USGS gage #03272000, 1914-23, 27-97
Gregory Creek at Mouth				
7Q10	cfs	summer	0.26	USGS gage #03272200, 1960-67 data
		winter	0.84	USGS gage #03272200, 1960-67 data
		annual	0.26	USGS gage #03272200, 1960-67 data
1Q10	cfs	annual	0.26	USGS gage #03272200, 1960-67 data
30Q10	cfs	summer	0.39	USGS gage #03272200, 1960-67 data
		winter	1.35	USGS gage #03272200, 1960-67 data
Harmonic Mean Flow	cfs	annual	1.93	USGS gage #03272000, 1914-23, 27-97
Pleasant Run at Mouth				
7Q10	cfs	summer	0.04	USGS gage #03274200, 1961-69 data
		winter	0.10	USGS gage #03274200, 1961-69 data
		annual	0.04	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.04	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.06	USGS gage #03274200, 1961-69 data
		winter	0.16	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.23	USGS gage #03272800, 1960-72 data
Banklick Creek at Mouth				
7Q10	cfs	summer	0.01	USGS gage #03274200, 1961-69 data
		winter	0.03	USGS gage #03274200, 1961-69 data
		annual	0.01	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.01	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.02	USGS gage #03274200, 1961-69 data
		winter	0.05	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.07	USGS gage #03272800, 1960-72 data

Table 8. Instream Conditions and Discharger Flow - continued.

Parameter	Units		Value	Basis
Twomile Creek at Mouth				
7Q10	cfs	summer	0.02	USGS gage #03274200, 1961-69 data
		winter	0.04	USGS gage #03274200, 1961-69 data
		annual	0.02	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.02	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.02	USGS gage #03274200, 1961-69 data
		winter	0.06	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.10	USGS gage #03272800, 1960-72 data
Paddy's Run at Mouth				
7Q10	cfs	summer	0.03	USGS gage #03274200, 1961-69 data
		winter	0.08	USGS gage #03274200, 1961-69 data
		annual	0.03	USGS gage #03274200, 1961-69 data
1Q10	cfs	annual	0.03	USGS gage #03274200, 1961-69 data
30Q10	cfs	summer	0.05	USGS gage #03274200, 1961-69 data
		winter	0.13	USGS gage #03274200, 1961-69 data
Harmonic Mean Flow	cfs	annual	0.19	USGS gage #03272800, 1960-72 data
Instream Hardness	mg/l	annual	308.	STORET/LEAPS; 822 values,2000-2008

Table 8. Instream Conditions and Discharger Flow - continued.

Parameter	Units		Value	Basis
Background Water Quality for the Great Miami River				
Aldrin	µg/l	annual	0.	No representative data available.
Antimony	µg/l	annual	0.	No representative data available.
Arsenic	µg/l	annual	1.9	STORET; 8 values,4<MDL, 1990-95
Barium	µg/l	annual	0.	No representative data available.
Bis (2-ethylhexyl) phthalate	µg/l	annual	0.	No representative data available.
Boron	µg/l	annual	0.	No representative data available.
Cadmium	µg/l	annual	0.1	STORET; 22 values,19<MDL, 1989-95
Chlorine, total res	µg/l	annual	0.	No representative data available.
Chloroform	µg/l	annual	0.	No representative data available.
Chromium^{+6}, diss	µg/l	annual	0.	No representative data available.
Chromium, total	µg/l	annual	0.	STORET; 17 values,17<MDL, 1989-94
Copper	µg/l	annual	5.	STORET; 22 values,20<MDL, 1989-95
Cyanide, free	µg/l	annual	0.	No representative data available.
Dieldrin	µg/l	annual	0.	No representative data available.
Fluoride	µg/l	annual	0.	No representative data available.
gamma-BHC	µg/l	annual	0.	No representative data available.
Heptachlor epoxide	µg/l	annual	0.	No representative data available.
Iron	µg/l	annual	1375.	STORET; 12 values,0<MDL, 1989-94
Lead	µg/l	annual	1.	STORET; 22 values,16<MDL, 1989-95
Mercury	µg/l	annual	0.	No representative data available.
Molybdenum	µg/l	annual	0.	No representative data available.
Nickel	µg/l	annual	0.	STORET; 22 values,22<MDL, 1989-95
Nitrate+Nitrite	mg/l	annual	2.91	STORET; 34 values,0<MDL, 1989-95
Pentachlorophenol	µg/l	annual	0.	No representative data available.
SAS-310	µg/l	annual	0.	No representative data available.
Selenium	µg/l	annual	1.25	STORET; 8 values,7<MDL, 1990-95
Silver	µg/l	annual	0.	No representative data available.
Strontium	µg/l	annual	0.	No representative data available.
TDS	mg/l	annual	408.	STORET; 11 values,0<MDL, 1990-95
Thallium	µg/l	annual	0.	No representative data available.
2,4,6-Trichlorophenol	µg/l	annual	0.	No representative data available.
Zinc	µg/l	annual	10.	STORET; 22 values,10<MDL, 1989-95
Miamisburg WWTP effluent flow	cfs (mgd)	design	6.19 (4.0)	DSW

Table 9. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum	Inside
		Human Health	Agri Supply	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Barium	µg/l	--	--	337.	3345.	4000.
Bis(2-ethylhexyl)phthalate	µg/l	284.	--	20.	2517. [A]	2100.
Cadmium [B]	µg/l	--	227.[A]	13.	31.	32.
Chromium^{+6}, dissolved [B]	µg/l	--	--	23.	31.	31.
Chromium, total [B]	µg/l	--	423.	429.	8267.	9100.
Copper	µg/l	3875.[A]	1486.[A]	36.	59.	81.
Cyanide, free	µg/l	1247000.[A]	--	28.	102. [A]	92.
Dieldrin [C]	µg/l	0.009	--	0.2	0.9 [A]	0.47
Gamma-BHC [C]	µg/l	13. [A]	--	0.6	10. [A]	1.9
Lead [B]	µg/l	--	417.	51.	927.	1000.
Mercury [C]	µg/l	.052	44.[A]	1.9	3.4	3.4
Nickel	µg/l	20870.[A]	904.	290.	2354.	2400.
Pentachlorophenol	µg/l	6749. [A]	--	853. [A]	1038. [A]	64.
Strontium [B]	µg/l	--	--	117800. [A]	230300. [A]	81000.
TDS	mg/l	--	--	2900.	--	--
Zinc	µg/l	276000.[A]	99990.[A]	569.	537.	620.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in pretreatment program.

[C] Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless the requirements for an exclusion are met as listed in 3745-2-08 (L).

Table 10. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time.

Phosphorus

Group 2: PEQ < 25% of WQS or all data below minimum detection limit; WLA not required. No limit recommended, monitoring optional.

Arsenic	Bromodichloromethane	Cadmium
Chlorine, total res.	Chloroform	Chromium$^{+6,}$ diss.
Chromium-TR	Lead	Nitrate+Nitrite
Strontium	Toluene	

Group 3: PEQ_{max} < 50% of maximum PEL and PEQ_{avg} < 50% of average PEL. No limit recommended, monitoring optional.

Barium	Copper	Cyanide, free
Dieldrin*	Gamma-BHC*	Mercury *
Nickel	TDS	Zinc

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

Mercury (>75%)**	Pentachlorophenol

Group 5: Maximum PEQ ≥ 100% of the maximum PEL or average PEQ ≥ 100% of the average PEL,or either the average or maximum PEQ is between 75 and 100% of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

		Applicable	Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum
Bis(2ethyl-hexyl)phthalate	µg/l	annual	22.	2100.
Dieldrin**	µg/l	annual	0.0014	0.24
Gamma-BHC **	µg/l	annual	0.057	0.95

* Grouping which is applicable prior to the mixing zone phase-out for bioaccumulative chemicals of concern (or BCCs) in November 2010.

** Grouping which is applicable after the mixing zone phase-out for bioaccumulative chemicals of concern (or BCCs) in November 2010.

Table 11. Final Effluent Limits and Monitoring Requirements

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Temperature	ºC	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/l	- - - - - - - - Not less than 5.0 mg/l - - - - - - - - -				EP/PD
Suspended Solids	mg/l	22.5	33.7 [d]	341	511 [d]	PD
Oil and Grease	mg/l	Not to exceed 10 at any time				WQS
Ammonia-N	mg/l					
Summer		6.7	10.1 [d]	102	153 [d]	EP/PD
Winter		11.2	17.2 [d]	170	261 [d]	PD
Nitrogen, Total Kjeldahl	mg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Nitrate+Nitrite-N	mg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Phosphorus, Total	mg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Cyanide, Free	mg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Nickel, T. R.	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Zinc, T. R.	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Cadmium, T. R.	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Lead, T. R.	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Chromium, T. R.	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Copper, T. R.	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Chromium, Dissolved Hexavalent	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				BEJ
Fecal Coliform Summer	#/100ml	1000	2000 [d]	–	–	WQS
Gamma-BHC, Total	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				RP
Pentachlorophenol	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				RP
Bis(2-ethylhexyl) Phthalate	ug/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				RP
Flow	MGD	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Chlorine, Tot. Res.	mg/l	--	0.038	--	--	PD
Mercury, T.R.	ng/l	- - - - - - - - - - - Monitor - - - - - - - - - - - -				WLA
Acute Toxicity	TU_a					
Ceriodaphnia dubia		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				WET
Pimephales promelas		- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				WET
pH	S.U.	- - - - - - - - - - - - - 6.5 to 9.0 - - - - - - - - - - - -				WQS
Toxicity Equivalent	pg/l	- - - - - - - - - - - - Monitor - - - - - - - - - - - - - - -				Penta
$CBOD_5$	mg/l	18.7	30.0 [d]	284	454 [d]	PD

[a] The effluent loading limits are based on an average design flow rate of 4.0 MGD.

[b] Definitions:

ABS = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l));
Anti-Deg = Anti-degradation Rule (OAC 3745-1-05);
BEJ = Best Engineering Judgment;
EP = Existing Permit;
FAR = Federal Application Requirements for biomonitoring;
M = Division of Surface Water Guidance #1, "National Pollutant Discharge Elimination System: Monitoring Frequency Requirements for Sanitary Discharges";
MZP = Mixing Zone Phaseout for determination of permit limits for pollutants such as mercury;
PD = Plant Design Criteria;
Penta = Dioxin monitoring using reporting code for toxicity equivalent due to the detection of pentachlorophenol (OAC 3745-33-07(A)(4))**;**
RP = Reasonable Potential procedures for evaluating exceedance of water quality standards, and requiring water quality-based effluent limits and monitoring requirements in NPDES permits (3745-33-07(A));
ST = 40 CFR, Part 133, Secondary Treatment Regulation;
WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ;
WLA = Wasteload Allocation procedures (OAC 3745-2);
WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7-day average limit.